LEONARDO JOURNAL

ARTISTS USING SCIENCE & TECHNOLOGY

Fall/1985 - Winter/1986

NOTICE TO OUR READERS

Late in 1985 the Ylem Board of Directors decided to switch from publishing a bimonthly newsletter to instead, a monthly Calendar and a quarterly YLEM JOURNAL.

The changeover has been a little rocky and we know some members have been confused by the change and frustrated by subsequent delays in publication.

With this first issue of the new quarterly Journal we expect to be on track for the remainder of the year. We have good supportive help, a new typesetting system, wonderful sources of new information, and editorial staff members who are determined to improve and enlarge the Journal with each subsequent issue.

Your monthly Ylem Calendar will keep you informed of current events and opportunities, the Journal will provide in-depth reviews, articles, and profiles--particularly profiles of the work and thought of Ylem members.

If you are not yet a member, or haven't renewed, see the "About Ylem" notes and membership form on the back pages.

Stay with us, it'll be an exciting year.

Fred Stitt, Editor

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This newsletter is published quarterly and distributed to members of Ylem.

Contributions are most welcome. Drawings, graphic pieces, photos; explanations; submissions to Opportunities, Random Access, or Calendar; short book reviews or articles are also sought.

"Yiem at play."
First Annual Halloween Party, 1985.

UPWARD PROFILES

by Beverly Reiser

In October a conference took place on "Technologies in Art," where art and science met for a two-day symposium in Salt Lake City. The conference was co-sponsored by The Utah Arts Council, the University of Utah Graduate School of Architecture and Departments of Art and Computer Science.

Paul MacCready spoke on how he has developed human-powered flight mechanisms, while Larry Albright presented his explorations with ionized gases as an art form. Larry Kaplan's work involves using diffraction grading and programmed neon to enliven architectural environments. Ed Emshwiller and Dale Eldred were exciting presenters at the conference. The following excerpts about their work and their design philosophies are from the Conference Program.

dale eldred
building with time and light

Dale Eldred is a creator of light sculptures of great scale with installations for museums, ballet and urban spaces. Eldred conceives color not as decoration but as energy or luminous fields. He emphasizes the basic interdependencies of light and shadow, velocity, gravity and time. In executing a particular work he utilizes both the geographical location and the architectural profile of a building or city.

I bring to my art something I much admire in others--a sense of adventure. I would walk a long way to see something I'd never seen before in my life. A friend of mine recently pointed out to me that in art that moves there is always this sense of adventure. He used Matisse as a great example, someone who was an innovator, working in a way that was totally independent of what other artists were doing.

I'm in a period of clarity now. What I create is made between invention and vision. I work with many people. I employ five people full-time, and I use large installation crews. At the same time, I've always remained a teacher. And it's been important to me to try to keep a hand on all the parts of what I do--the contractor, the financier, the person responsible for securing insurance--so that I can keep understanding them. I don't job it out to somebody else to do. I hold on, because I'm always afraid that I could lose part of the answer to the problems that arise during the days of very difficult installation.

There's nothing random in what I do. After all, this work is about time, about the fourth dimension. What I do is totally locked into real time. For example, the work on the north face of the Minneapolis Institute of Art functions very precisely with the passage of light that crosses there exactly at twelve o'clock noon. The board across the north face is red fluorescent which is light reactive material. Across from it, I'm using two south-facing mirror banks. The mirrors are set at exactly a proper declination to the sun. At twelve o'clock, the sun strikes the mirrors and the mirrors direct the light back to the flourescent board. The viewer can stand in the passageway and observe. It's built to arch over automobiles. The light "tracks" across the red board in a period of focus for five minutes. If you stop for a bit, you might realize that you're watching the rotation of the earth. A very ancient ritual, one that goes back to the Mayans and to the Plains Indians.

When you look at the diffraction wall that's placed 50+ stories up on the roof of the Multifoods Tower in Minneapolis, on a sunny day you're looking at the wavelength of light. It's really a phenomenon in that what you're looking at is light, pure light, the essence of light, visible in its prismatic form, up to 22 miles away. The turning of the earth and the resulting change in our position relative to the sun is visibly recorded on the sculpture's surface as one color fades slowly into the background while the succeeding color in the spectrum bursts forth in brilliant focus.
It's important that people make a distinction between the art and the instruments that make the art possible. The engineering makes the art possible, puts it into position to happen. It's the idea that interests me, though, the realization of relationship that comes out of the art. If there's anything I would put forth as my vision, it is man's relationship in his universe. And that relationship is made clearer by what I might put together. My work is not about huge masses. It's about one individual, standing and viewing, seeing so much at one particular moment.
And what the viewer sees at any particular moment is unique, totally, absolutely unique at the moment, because even if you return at the same time the next day, it cannot be the same, because everything in the cosmos is going through minute change. This work is about the nature of physics; this work is about the nature of nature.

ed emshwiller
electronic imaging

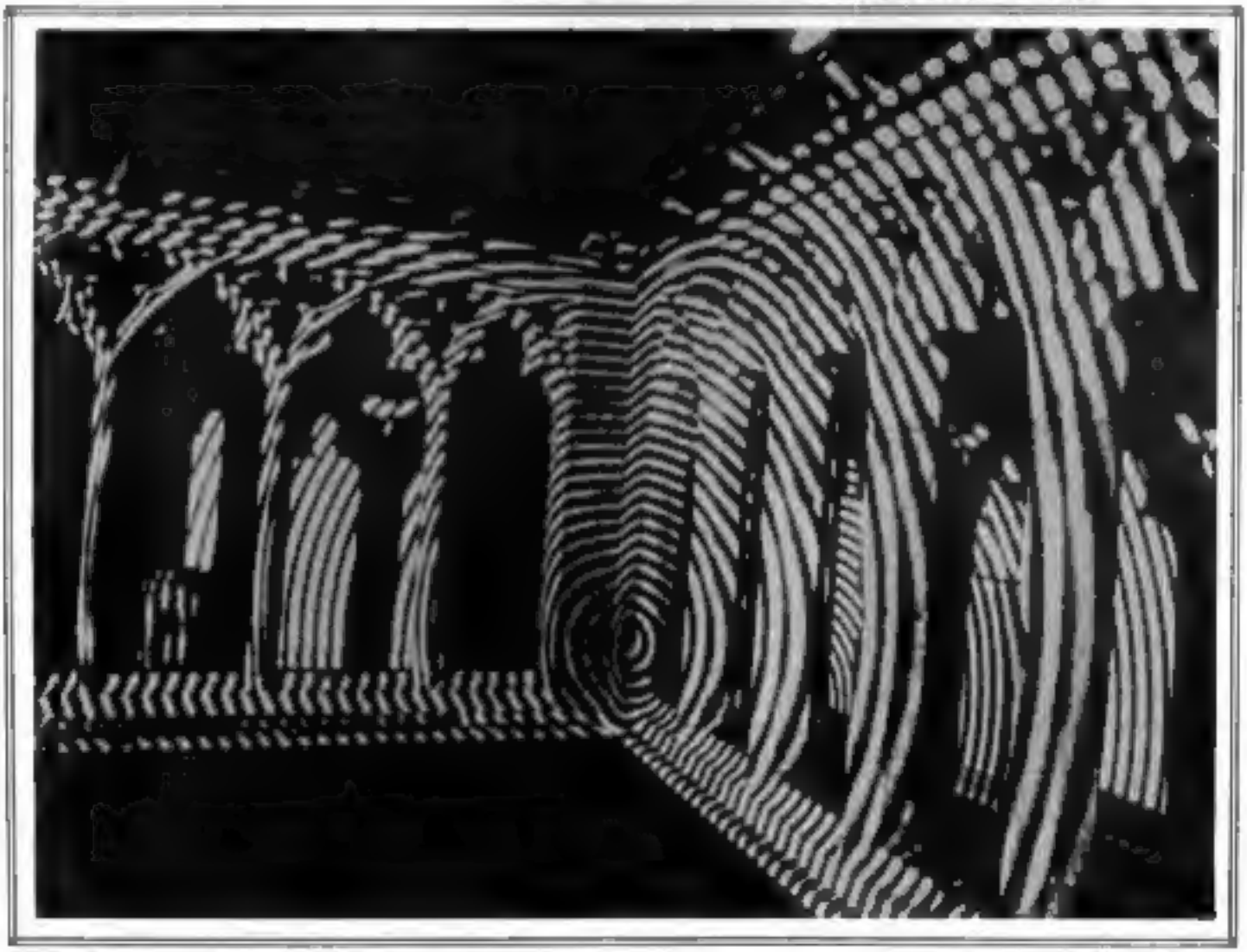
Ed Emshwiller is a pioneer image maker in film, video and now computers, Dean of the School of Film and Video, Provost, California Institute of the Arts.

Image making best describes the range of Ed Eshwiller's work and extensive experimentation. While developing a reputation as an abstract expressionist painter, he was also an illustrator for popular science fiction credited with some 500 covers for books and magazines. During the 60's and 70's he was active in the New American Cinema making experimental films and multi-media performance pieces.

Pens, brushes, still cameras, movie cameras, video, computers are tools for artists. All have particular characteristics. All make certain types of images. All cause the artist to think about what and how to do his work. All require knowledge of procedures and the development of manipulative skills.

Artists today have mastered a vast array of tools. The possibilities are enormous. One can create images in all sorts of ways. But the basic problem always remains the same. how to make effective art that is "meaningful."

Dale Eldred, "Medieval Cloisters," 1979 Museum of Art, Kansas City.



COMPOSITIONS IN CHAOS

BY IVARS PETERSON

Dot by dot, the black screen fills with color: an iridescent dragon clawing at its own tail, a swirling, rainbow-hued galaxy scattering vivid sparks, geometric fountains spilling colored streams into still, black basins. Each picture represents a frame in a mathematical experiment.

To mathematician Robert L. Devaney of Boston University, the colors and patterns have special meanings. He is one of many mathematicians now using computers to explore the behavior of mathematical expressions. "I see a whole new branch of mathematics developing called 'experimental mathematics,'" said Devaney. "Most other sciences-physics, chemistry, biology- have very definite, well-entrenched experimental sides as well as theoretical sides. Now the computer is becoming the mathematician's laboratory."

Computer pictures "open whole new worlds to the theoretical side," said Devaney. Pure mathematics asks: Is it true or isn't it? Experimental mathematics suggests possible truths that can then be explored more rigorously and formally.

Devaney's explorations involve the simplest "transcendental" mathematical expressions: the exponential, sine and cosine functions. The exponential function, represented by e to some power x, is familiar to anyone dealing with compounded growth, whether in populations or in accumulated interest in a savings account at a bank. The sine and cosine functions (usually written as sin and cos) are often associated with angles and come up in numerous trigonometric applications such as navigation or surveying.

Interest in these simple functions behavior of nonlinear differential equations that are used to describe or model fluid flow, the formation of weather systems and other natural events. For the past decade or so, many investigators have discovered that under the right conditions, these equations themselves seem to generate "chaotic" numerical results. At the same time, researchers have also realized that even the simplest natural phenomena at times appear to show chaotic behavior.

"Inevitably, you want to study specific equations that arise, but very often these are just too complicated to understand," said Devaney. "So you are led inexorably to simpler and simpler systems. If you can't understand the exponential, sine and cosine maps [or functions], then you don't have any chance of understanding something more complicated."

In addition, Devaney noted, "since the simplest possible models give chaotic behavior, one must assume that for complex models there would be even more complicated behavior, so that any physical system should exhibit some degree of unpredictability despite the fact that it's deterministic."

In his studies of the "dynamical" behavior of simple mathematical expressions, Devaney chooses to deal with "complex" numbers rather than ordinary "real" numbers. When complex numbers were invented centuries ago, no one could think of any practical uses for them. Now they regularly show up in methods for solving differential equations and in other applications of calculus. They also play an important role in describing physical phenomena like electromagnetism and the properties of electrical circuits. As a result, it becomes important to know how the exponential, sine and cosine functions behave for complex numbers.

A complex number, z, is made up of a "real" part and an "imaginary" part. It may be written as $x + iy$, where the symbol "i" represents the square root of -1. These numbers can be plotted on a graph to produce what is called the complex plane. For example, the complex number $2 + 3i$ would be plotted at a point that is 2 units to the right of the vertical (imaginary) or y axis and 3 units up from the horizontal (real) or x axis. Thus, every complex number is located according to its coordinates somewhere in the complex plane.

The process of iteration, performing the same operation over and over again of successive answers, is the key to Devaney's colorful, computer-generated graphic designs. He selects a particular complex number z and calculates, for example, sin z. Then he calculates the sine of this answer and repeats the process for each new answer. Depending on the value of z chosen, the same answer may come up every time (a fixed point). On the other hand, the answers may get steadily larger. In the latter case, Devaney assigns a specific color to the original point in the complex plane.

"We color a point in the plane if an iterate of that point ever has an imaginary part larger than 50 or smaller than -50," noted Devaney. "So the colors tell me how 'quickly' a point goes to 'infinity.'" In his computer pictures, red represents points that explode beyond the limit in only one or two steps. The color orange, yellow, green, blue and violet represent successively slower rates. Black areas encompass points that, upon iteration, map into values that do not escape.

The black areas, called basins of attraction, are stable regions. Devaney explained, "All points that are colored black, under iteration, tend toward fixed points or periodic points called attractors." The colored areas represent unstable, chaotic regions. For these values of z, the chosen function seems to behave randomly. "I'm interested in understanding the differences between stable regions (the black regions) and the colored regions," said Devaney.

The colored regions for a given complex function also give the "barest outline" of something called the Julia set (named after French mathematician Gaston Julia). This mathematical set contains ∎ "repelling, periodic points" that seem ∎ drive neighboring points farther and farther away. The collection of these special points corresponds ∎ a "strange repeller." The complex plane thus divides into two intricately shaped regions: basins of attraction centered on "attractors" and Julia sets corresponding to "strange repellers."

The Julia sets that Devaney finds are also fractals. Examine any of the patterns closely and one finds that their features tend ∎ replicate themselves on smaller and smaller scales. A fist bursts in fingers that each burst into smaller fingers and so on.

Small changes in a function can radically change the form ∎ the graphs. If the exponential function is multiplied by a constant factor, 1/*e*, and then iterated, the resulting picture shows a small, sedate fountain within a large black basin. Make the constant slightly larger, and the picture changes dramatically. "The Julia set explodes from a relatively small piece of the plane into two spiralling galaxies," said Devaney. Similarly dramatic changes occur when sin *z* is multiplied by various values of a constant ranging from 1 + .05*i* to 1 + .8*i*. As the imaginary part of the constant grows, the basin ∎ attraction disappears.

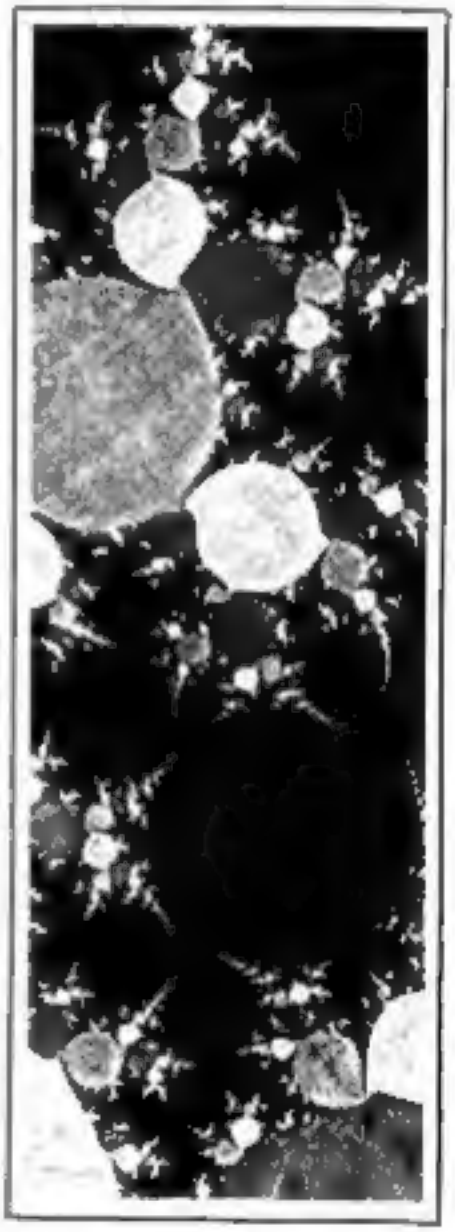
"There are many complex analytic functions out there, ∎ of which seem ∎ have their own characteristic behavior," said Devaney. It would be useful to study a whole class of these different functions ∎ get some idea ∎ this behavior and then ∎ extend the studies ∎ higher dimensions, he said.

Ironically, the mathematics is proving to be so interesting that many of the mathematicians now working in the field are being led away from the physical applications that originally motivated the studies and away from trying to understand the roots of chaotic behavior in nature. "The process that made us study simple functions in the first place probably won't be reversed," said Devaney. "We're discovering so many new and interesting phenomena." These discoveries may eventually lead to entirely different, as yet unknown applications from those originally envisioned.

"It's really the computer that generates the mathematical problem," said Devaney. "You see something on paper, you try to explain it mathematically, but you can't. So you do more computer graphics, and it goes on like that."

But is experimental mathematics a legitimate part of mathematics? Heinz-Otto Peitgen and his colleagues at the University of Bremen in West Germany, in describing their own computer graphics approach to exploring iterated functions and their Julia sets, write in THE MATHEMATICAL INTELLIGENCER (Vol. 6, No. 2, 1984), "Experimental mathematics will likely never be accepted as 'real' mathematics by most mathematicians. But for many enthusiasts it has become more than an engaging hobby - it is rather a passion. While such experiments will continue to enhance our mathematical intuition in the future, they might also develop into a sophisticated art form."

Computer experiments are bringing excitement and a new visual beauty to mathematics. Philip J. Davis and Reuben Hersch in their book The Mathematical Experience (Birkhauser Boston, 1981) highlight this appeal. They write: "Blindness to the aesthetic element in mathematics is widespread and can account for a feeling that mathematics is dry as dust, as exciting as a telephone book....contrariwise, appreciation of the element makes the subject live in a wonderful manner and burn as no other creation of the human mind seems to do."



Julia Sets and fractals: Pattern features replicate themselves on smaller and smaller scales.

THE TECHNOLOGY OF THE BRAIN

PART TWO

By Fred Stitt

Within the fist-sized body of brain tissue that each of us possesses, we're constantly processing something like one quadrillion bits of data per second.

That number is derived by estimating the "switching" activities of a single brain cell and multiplying that number times the number of active brain cells as estimated by most neural researchers. (I covered the background data in the August issue of the Ylem Newsletter.)

The scope of this activity can be dramatized by using a computer/video analogy. The processing volume of the human brain would be comparable to running English words across a TV screen at a rate of 15 billion words per second.

Once the enormity of this mental processing power sinks in, some difficult questions arise. Among them, the equivalent of: "If we're all so smart, why aren't we rich?"

The demonstrable truth is we are all smart--incredibly so. And equally demonstrable is the fact that most of us aren't making much of it. How come?

There are clues that existing language structures we use in thought processing are a barrier, that they slow us down. There are clues that we practice a tremendous amount of mental self-repression and use our intelligence to block itself from working.

The brightest children often learn the fastest to keep their thoughts to themselves in the face of the hostility of others similarly self-repressed. When state schools for mentally retarded children started shutting down not many years ago, thousands of incarcerated children were discovered to have extraordinarily high IQ's. They had been extremely fast to adapt at very early ages to the behavior that was to "be good" and behave like retarded children are supposed to behave.

If one imagines the public schools as a form of institution for the mentally retarded, we might find a partial explanation for the paradox of enormous human potential existing side-by-side with sadly limited application.

Take a look at the daily classroom operations of most schools. If you measure the time given to actual intellectual training and to the delivery of solid information, the numbers are pathetic. Between show-and-tell and lessons on tooth brushing and intercom interruptions about assemblies, there's barely ten minutes a day given to mental development. That's the data delivery rate up through the third grade.

An extreme estimate? It's what I wrote down when I was in third grade and no one I've spoken to since has noted any improvement. The time given to conveying substantial information expands to perhaps 30 minutes by sixth grade. But most so-called school and homework is just simplistic, repetitive, mind-numbing drills.

Here's a for-instance: Trigonometry can eat up two semesters of class time in a high school. Yet all the concepts and applications anyone needs to use trigonometry can, and often are, learned in self-education over a single weekend.

Another for-instance: Ordinary children who attend child-oriented schools such as the Montessori preschools may enter their first grade public school class already knowing all the math that the public school will present to them for another six years. The public school drags it on and on, year by year, previewing what's to come, reviewing what went before, with virtually nothing of content between the previews and reviews.

The drag-down factor becomes especially dramatized in those instances where some child is discovered to have reached adolescence in a back-woods environment without benefit of any schooling at all. Given a little tutoring, they pick up their missed grades on through six, or eight, or ten, in about one-year's time.

So it takes about one year to learn the skills and content offered through most of the years of elementary and junior high school.

There may be an extraordinary situation buried in these observations. For example:

If public schooling is so intellectually out of it that it rations out one year's worth of education through say eight years, then it has to reverse its ostensive purpose. It has to become an instrument, not of learning, but of massive repression of learning.

Judge for yourself. Would you willingly tolerate an education that

was holding back at this scale? Would you willingly tolerate any service that specialized in withholding rather than delivering? Not willingly, but of course the education service isn't voluntary.

The educational picture darkens year by year. It has to.

It would be intolerable for the instructors, the administrators, the school boards, the text book companies, the government agencies, to encourage true all-out creative and intellectual development.

Why?

Because true creative and intellectual development requires the practice and development of maximum skills of inquiry and experimentation. People can learn to experiment only by experimenting and most experiments fail. People learn to ask good questions by going through the process of asking extremely dumb questions. People create great and original new concepts by first going through a process of creating trash. People learn to succeed by failing.

This is the truth and the schools can't and won't adjust to it.

Furthermore, for experiments, questioning, creativity to mean anything to a person, the efforts have to be self-generated. Children have thousands of important things to ask, and test, and challenge. What they get is top-down dictated, directed, and scripted Question-and-Answer drivel that dominates endless days in every public school classroom.

If people fully understood what was being done to them and their children they wouldn't stand for it. That prospect, even hints of such a prospect, frighten any social establishment to its core.

The solution was adopted by the establishment long ago. It wasn't an intentional evil, not a conscious conspiracy, it's just something that "happened." To prevent the disruption of massive challenge of the concept of controlled compulsory education, a now long-standing tradition was established. A tradition that has the result of short circuiting the kinds of curiosity, questioning, and creative thinking that would threaten the entire snail's pace educational system.

It's a rock solid tradition of inhibiting, repressing, delaying, discouraging, dismissing, denying, and derailing children at every stage of their natural intellectual development. The kids start school and they start most school years with great excitement and eagerness to use the massive brain power with which they were born.

The excitement turns grey as children find their most adventurous mental explorations are put down as "too advanced" or "not very sensible" or "not something most people would agree with." The rewards go to those who can slow their mental engines down to a nice quiet, nondisruptive idle.

The worst ultimate result is not just low national testing scores. Those standards are pathetic in themselves. The ultimate result is a national population that feels profoundly uncomfortable even thinking about such things as the topic of this essay. Uncomfortable and profoundly unprepared to think about their own mental processes. They have never in their school lives received specific technical instruction as to how their brains work and how to work with their brains.

Another consequence: People normally have a universe of knowledge and interest when they start out but that gets increasingly narrowed through education.

We all have all the capacity in the world to be comfortable with words as well as numbers, with theory as well as practice, with art as well as technology, with commerce as well as wider social concerns--but we're all told again and that we HAVE to be one thing or another. Supposedly we can be moral OR rich, but not both, efficient OR humane, atheletic OR studious, artistic OR scientific, logical OR intuitive, and on and on.

Who says? Who establishes these limits? Only one group: Extremely self-limited people who have a vested, albeit unconscious interest in keeping everyone else in the same unfortunate state.

How does one break away? How does one make up for a school system that drags out one year's worth of development over six or eight years? How does one find mental capabilities that are not only unused but are now often self-denying and self repressive?

There are signposts towards an escape to normalcy in the work of our techno-aesthetic artists, scientists, craftspeople and theorists. Here we find people who don't limit themselves to one narrow part of neural functioning. We find people who have not repressed their willingness to explore, experiment, and "be wrong." We find people who enjoy and cheer on others who are trying to maximize their potential. It's a large part of what Ylem is all about and we'll be reporting along these lines extensively in the months ahead.

YLEM forum

December 14, 1985

By Grace Reim

The December 14 YLEM Forum at Santa Clara University featured the "bubble magic" of three Bay Area guest artists.

Ken Herrick, a University of California, Berkeley graduate and current Oakland resident, presented a sample for sculpture utilizing neon. Herrick has been drawing upon his training as an electronics engineer to make kinetic sculptures since 1980. Specializing in neon for the past 3 years, he describes himself as a "half-time" engineer, so that he might devote more time to his artistic interests. al phenomenon.

Herrick creates his visual affects by evacuating glass tubing of air, and refilling it with an appropriate rare gas. He explains that 3 factors will influence the colors yielded, including the type of gas, color of glass, and the inclusion of fluorescent phosphorus coating on the inside surface of the glass. His 1985 work features an 8'-tall neon columnar triad, standing on a black glass pyramid, itself outlined in neon. Passing viewers trigger the appearance of neon "bubbles" that rise or fall, then fade away.

Herrick's works have been on exhibition at the San Francisco Art Commission Show, the Civic Art Gallery in Walnut Creek, and the Berkeley Art Center. His kinetic sculptures include "Ahhh...So Delicious!", a stream of neon "bubbles" pouring from a levitated pitcher into an eager mouth, and "Say What?"--four glowing neon "Nixie" tubes on curved columns delivering a silent monologue.

He is currently arranging for commercialization of the neon-bubble invention for which he has applied for U.S. Patent.

While "researching the new visual effects he'd be able to create in neon tubes," Herrick came across the phenomenon of what he calls "neon bubbles." He found that initially he was unable to control the flow of the bubbles--"they drifted fleetingly, too rapidly to see." After approximately a week of additional experimentation, Herrick learned to control the phenomenon. This method of generation and control is the subject of his U.S. Patent. He is also trying to arrange for additional, world-wide coverage, that he might establish his method as a marketable, commerci

This artist has been creating sculptures for years that incorporate aspects of motion, sound, and light in art form. He hopes to "get back to designing more sculptures that may incorporate neon, but not feature it exclusively. It is simply a matter of finding the time to execute them."

Dr. Ilan Chabay, Palo Alto--an internationally known laser research scientist and chemist turned science education consultant--exhibited his "frozen bubbles" at the Forum. This relatively simple demonstration is nonetheless rich in scientific principals at all levels. When Chabay drops an ordinary soap bubble into an open, insulated box with dry ice on the bottom, it bounces on an invisible layer of carbon dioxide, which is denser than normal air. After the bubble mysteriously expands, it changes color, and then finally "freezes." It expands because it acts as a semi-permeable membrane, allowing the carbon dioxide to pass inside but not the other gases to escape. This is a model of the cell membranes in every living thing.

Chabay is interested "in the use of visual images as a vocabulary for thinking, that those images become the basis for forming conceptual models of our environment (in the most general sense of the word). I illustrate, with particular exhibits, the ways in which these ideas contribute to learning, and also the process with which I design them."

The artist's studies and exhibitions have led him literally across the globe. After receiving his Ph.D. in chemical physics at the University of Chicago, he spent two years doing post-doctural research in biophysical chemistry at the University of Illinois in Urbana. While employed by the National Bureau of Standards for 7 Years, he developed several significant new techniques for aerosol size measurement and for chemical analysis with lasers. In 1971, he spent 7 months lecturing at Japanese universities, and has published more than 30 papers in major scientific journals. He has lectured throughout the U.S.and in Europe, Japan, and Korea.

From June, 1982 through August, 1983, he was Associate Director of the Exploratorium in San Francisco, where he developed exhibits, wrote testimony on science education for the United States Congress, and coordinated communication with state agencies. As Consulting Associate Professor of Chemistry at Stanford University, he teaches physical and analytical chemistry,, and is collaborating with Professor R.N. Zare on the development of a set of experiments, and on the use of lasers in chemistry.

Dr. Chabay is currently Director of the New Curosity Shop in Palo Alto providing consulting services in creative science education. In 1984, Chabay conducted a 2-week long regional workshop on science education for teachers and students from nursery through high school, using activities involving hands-on exhibits he constructed during the workshop.

Tom Noddy doesn't classify himself as an artist. He explains that he is rather a performer, who demonstrates his vaudeville art as the substance of his act.

This 'performer' first became interested in 'bubbles' when he watched a college friend put smoke into bubbles. Full of ideas, he decided

to go to Europe and want to work at a factory in New Jersey to earn travel money. Though he quickly set a date for quitting, the job enabled him to buy bubbles, which he experimented with every night for 10 months. "Basically it was something to keep me home at night, so I wouldn't go out and spend my money."

Noddy was finally able to go to Europe, where he attracted crowds as a street performer. His puppet shows bore political, social, spiritual, and satirical themes, and he survived by passing the hat. But for the last 14 years, he has 'played' with bubbles almost exclusively.

The bubble enthusiast has been on the Johnny Carson Show (1982), and also twice (1982-83) On The Road With Charles Kerault, CBS human interest newscaster. He has also presented his 'bubble magic' on TV in 14 countries and 5 continents, including Japan and Europe. Noddy describes himself as the "The Bubble Guy": "I tell jokes, show bubbles in the act that is my livelihood. The act includes bubbles inside of bubbles, smoke inside of bubbles, inside out ying yang bubbles...I use soap bubbles (the same kind kids use), two wands, a cigarette, a straw, and I entertain people."

The Bubble Man has appeared in science museums across the country, including the Exploratorium, for the Bubbles Festival several years ago. He explains that "bubbles are minimal surface structures that always find the most economical form possible. When bubbles meet, they do that economically--for that reason, a single bubble in the air is always a sphere, and when bubbles meet, they always meet three walls along an edge, forming 120 angles. Four of those edges will meet at a point at 109, 28 minutes and 16 seconds. That is true of all the suds you've ever seen: there are only those two angles. Out of that apparent chaos, we find that there is a very stable order."

RANDOM ACCESS

TECHNO BLISS/FEAR

Jan 6-Feb 7

Feb 10-March 14

Two art shows co-sponsored by the Santa Clara University Art Department and the Institute on Technology and Society, will explore several artists' relationship to technology, including that of VLEM members:

-Susan Brown
-Luz Bueno
-Daniel Cooper
-Eleanor Kent
-Donna Cohen
-Josepha Haverman
-Kennan C. Herrick
-Ken Knowlton
-Beverly Reiser
-Stir Seier

When Kelly Detweiler, Assistant Professor at Santa Clara University and Curator of Techno Bliss/Fear, saw a somewhat primitive painting of a home computer-rendered loosely in oil paint, in a garish frame, the initial idea for the two art shows was spawned.

Kelly felt that by depicting this "symbol of respectability and technology, the artists conveyed the anxiety most of us feel or have felt about the barrage of technological advancements."

Kelly was fascinated by this idea which corresponded with the arrival of a sophisticated graphic computer in the art department where working as a painting teacher. Kelly's attitude at that time was somewhat negative towards the technological revolution-due in part to fear and laziness. But, "I started to play around with our new computer, and while I don't think the images I have made with it are art-yet-I can now see the possibility of technology and art merging. My involvement in the techno shows unveiled many examples of rich, interesting art being made with technological media. There remains, on the fun side, direct statements by artists concerned about the implications of a world gone "techno."

Both exhibitions will be held at:
The Freighedoor Gallery
Art Department
Santa Clara University
Alameda at Bellomy
Santa Clara, CA 95053

For additional information call:
(408) 554-4594

Opening Receptions:

Bliss	Fear
Jan 10	Feb 21
6-9 PM	6-10PM

Tech Art Wanted For Big Los Angeles Show

The Fine Arts Exhibit is looking for tech art (laser, kinetics, computer graphics, neon, etc.) for a "New Visions" show to be held September 11-28, 1986 during the Los Angeles County Fair in Pomona, CA.

Not to be compared with most county fair exhibits, we have 10,000 square feet of bona fide gallery space with track lights, air conditioning, pedestals and movable walls. We are also looking for artists interested in demon- strating some aspect of their tech art to the public throughout the Fair (payment will be discussed). We cover shipping and insurance costs.

Please contact as soon as possible for further information. Our deadline is March 31, 1986.

Call: David or Kim Svenson
(714) 626-4116

Or write: New Visions
4438 Via Padova
Claremont, CA 91711

L.A.S.E.R. NEWS

By Louis Brill

The Laser Arts Society for Education and Research (L.A.S.E.R.) is happy to announce several exciting new activities, including the expansion of L.A.S.E.R. NEWS, and plans for continuing a public presentation forum for holography and kinetic arts.

L.A.S.E.R. NEWS, the quarterly newsletter, is evolving into a 12 page offset publication. The newsletter now creates an ongoing forum presenting up to date discussions on production techniques and fine art developments of national and international holographic activities. Forthcoming issues plan to deal with applications of holography in publishing, instrumentation design, computer graphics and entertainment. The newsletter is now prepared with the assistance of a computer aided publishing format. Using a Macintosh with Pagemaker and MacDraw software, L.A.S.E.R. NEWS will present a 'new look' to its membership. And what more appropriate medium to print in then the Apple LaserWriter printer.

Expanding our membership activities, L.A.S.E.R. is now making plans for quarterly public meetings on the the state of lasers and kinetic arts. Drawing upon membership resources and talents we will continue in 1986 with presentations on demystifying technologies of holography, computer graphics, and kinetic light environments. L.A.S.E.R. will continue collaborating with YLEM and also WAVEFRONT, a Canadian holography group pursuing similar activities. This includes exchanging newsletter information and speakers at our meetings.

As we plan our 1986 speaking schedule we invite artists involved in lasers, kinetic art, light sculptures or multimedia performances to contact L.A.S.E.R. for presentation opportunities during the year. L.A.S.E.R. is also planning a surprise benefit event this spring...so watch for an exciting announcement.

People interested in joining L.A.S.E.R., please send $12.00 membership. People interested in presenter opportunities should direct inquiries to:

L.A.S.E.R.
c/o Program Director
P.O. Box 42063
San Francisco, CA 94101

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EXPANDED VISION

Artists Using Technology - 1985

OCT 23-DEC 22, 1985

With this exhibition at the Jack Gallery, New York, The Studio for Visual Technologies in Fine Art broke new ground as the first major New York display of techno-based fine art produced as multiple originals in limited editions. The exhibition introduced the multiples of 11 international artists, who receive support in research, development, engineering at the Studio's atelier, and in the process of creating new art forms, humanize and make accessible to a participating public a wondrous use of high technology in today's society.

The participating artists included YLEM member SUSAN BROWN, whose images of extremely intricate surface textures are composed of thousands of lines layered into complex forms. Using a FORTRAN program run on a Control Data 855 computer, Brown produced her plotter-drawn, computer woven "CURVES VIOLIN". By controlling the placement, density, and color of individual lines, she can create a myriad of colors and forms.

To create her 45"x32" "RIBBONS IN LOVE", Beverly Reiser used the television-like glow of neon behind sand-blasted mirror to explore gestural movement which interacts with the reflective surfaces of her mirror forms. Her constructions are highly dynamic within the environment, imbuing the space around them with distinctive colors. Her large-scale commissioned installations include several prominent Bay Area architectural firms.

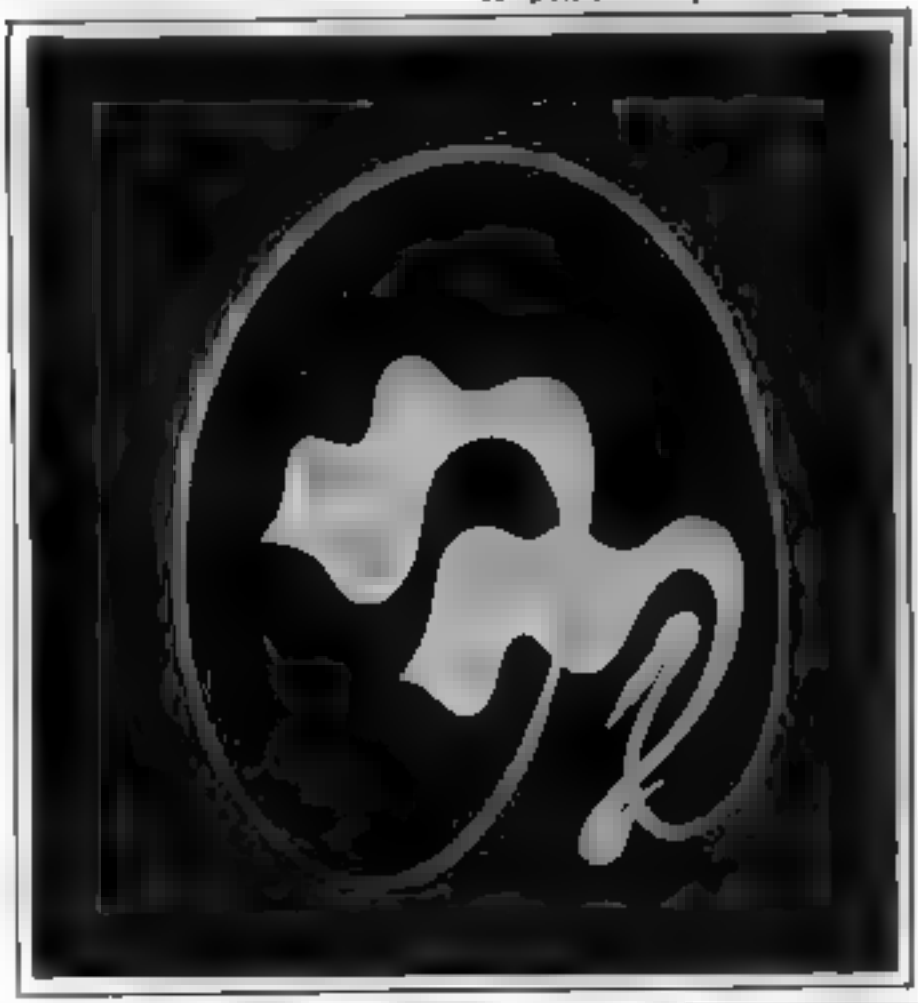
We live in the age of technology, and contemporary artists have the opportunity to use the powerful tools of our time--computers, micro-chips, holography, and neon, among others--to expand their artistic vision and develop new forms of communication and expression.

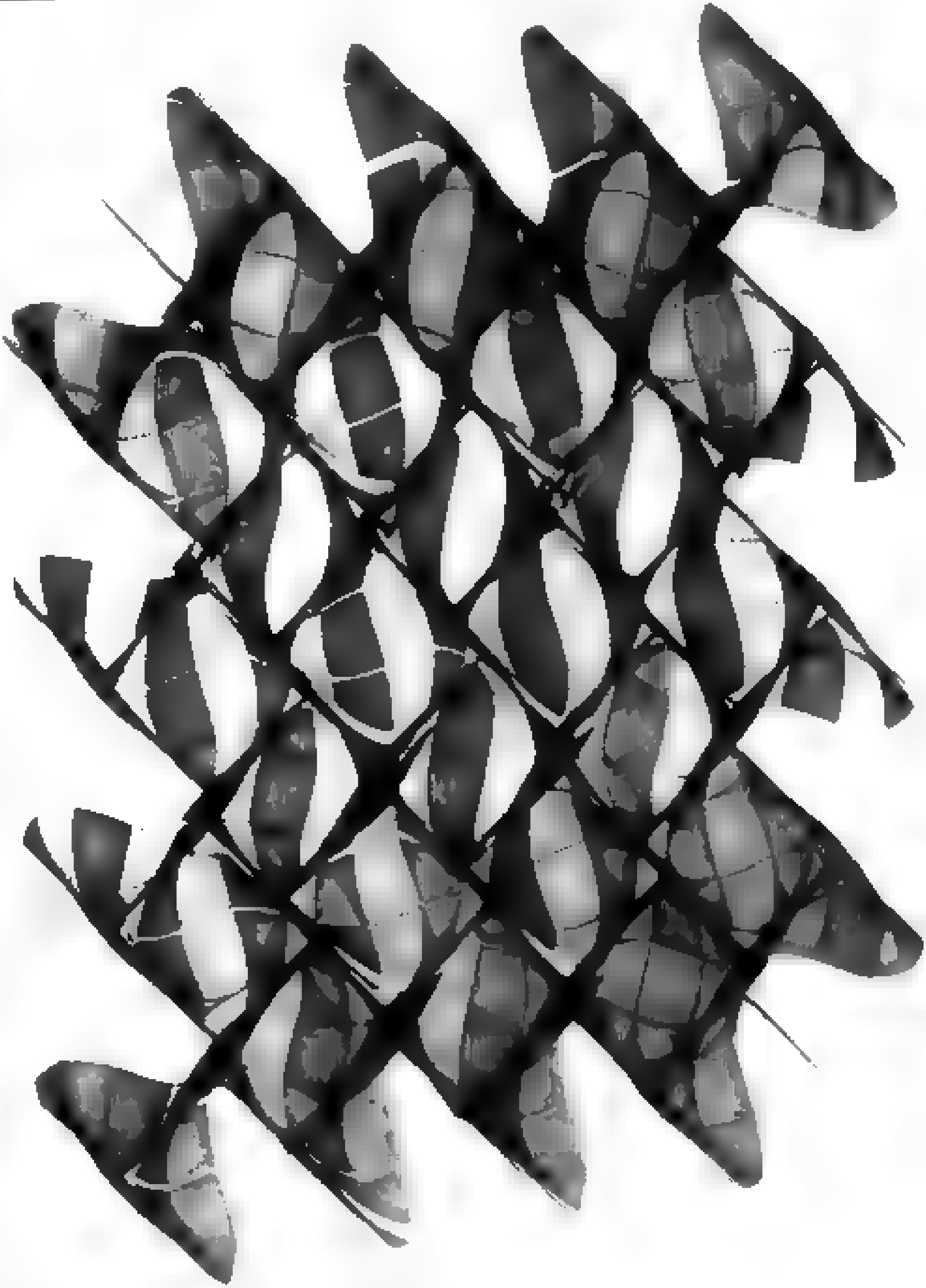
The Studio for Visual Technologies in Fine Art is a high-tech atelier dedicated to the advancement of new art forms, incorporating the latest techniques and forms of presentation. The Studio serves as a complete publishing atelier dedicated to editioning works by artists experimenting with new fine art media. It is structured to address the unique needs of technologically-based artists and their collectors.

The Studio for Visual Technologies in Fine Art is located in Stamford, Connecticut. For more information please contact:

Irene Hopkins,
Associate Director
The Studio for Visual Technologies in Fine Art
652 Glenbrook Road
Stamford, CT 06906
(203) 348-1574

Beverly Reiser, "Smiles," 1985. Neon and sandblasted mirror.





Susan Brown, "Curves Main," 1985
Computer generated surface texture

FIFTH SYMPOSIUM OF SMALL COMPUTERS IN THE ARTS
(October, 1985 at the Philadelphia Hilton Hotel)

by Trudy Myrrh Reagan

An intimate, relaxed, home-brew symposium took place in the large and formal rooms of Philadelphia's Hilton Hotel. The symposium demonstrated to some seventy souls that skill and imagination are the driving forces in the computer arts. This was quite a different impression than was delivered at SIGGRAPH '85 in July, when artists cast envious glances at fancy "high-end" computer systems. I felt good being with people who work with equipment like my own, but who have far better ideas.

Escaping the Confines of Art With Computers

The history of art in this country is peppered with artists jumping from the boundaries of fine arts into everything from industrial products to well-rusted junk. Computers are no exception, the difference being that these "universal machines," are more than the mere tools or materials of their artist-predators. This fact was well-documented by a historical survey of computer art by Cynthia Goodman of the Guggenheim Museum.

I marvelled at the panoply of images and concepts dating from 1963 that she presented, and was encouraged that someone in her position was so passionately serious about their genesis.

Later, after seeing the Ylem videotape, "Five Aspects of Computer Art," she requested information about a couple of early users of the medium out West. The tape was shown at one of the evening events held nearby at the Chestnut Bar and Grill. I could not attend the other event, a computer music concert.

Escaping the Confines of the Computer with Art

Walter Wright, of Virginia Commonwealth University, made the point that each artist has something different to communicate, and thus a different set of tools in his or her kit. The pre-packaged paint program has the effect of homogenizing art, by making all artists use the same predictable bag of tricks.

I came away from SIGGRAPH '85 dejected--fascinated, yet ambivalent about fancy paint systems I had seen but could not afford. What was the computer I had bought good for? Would the use of any computer improve my body of work? After all, I draw and color more efficiently by hand. What I enjoy about the systems I have tried, I now realize, is their ability to transform images.

Fortunately, the papers presented concerning screen images emphasized these very transformations, performed by artist-written programs. These drew images on unusual grids plotted by computer, filtered colors by number crunching, and changed one outline into another. Wright's students produced several rich and odd effects to illustrate "Chaos." This represents an investment in time and ingenuity perhaps, but not money.

Both here and at SIGGRAPH, I looked for the high level of imagination I enjoy in off-beat animated films, when I get a sense of the artist behind the machine. I felt at home here, where LOGO Dragon Curves became weaving designs: page layout software made concrete poetry, whimsical tabloids, and conceptual books; and "virtual sculpture" existed only in the synthetic 3-D of computer animation.

Isaac Victor Kerlow of New York discussed the process of turning his images into etchings and serigraphs. These are hybrids, incorporating 3-D geometrics modelled on a VAX (Ylem Newsletter, July 1984), low-resolution Apple images, and drawings by hand. Kerlow, who spent part of his life in Mexico, has explored the similarities between Mayan art and computer geometry. The combination of subject matter, poetic treatment, hybrid images, and tactile quality of fine art prints has become much more than the sum of its parts. Kerlow is an Ylem member who also spoke at SIGGRAPH.

Music, and music-image combinations were demonstrated in the adjoining room, and I only regretted not being in both places at once.

Computers Viewing Artists At Work

The last paper was presented by a husband-wife team. Joan and Russell Kirsch have combined the experiences of two long and very different careers in a most unusual analysis of the paintings of Richard Diebenkorn.

Joan Kirsch, an art historian at American University, was impatient with the rarefied and imprecise language of art criticism. She borrowed the concept of cognitive "shape grammars" from artificial intelligence (AI). Using them to code her intuition, as in sentence diagrams, they helped her uncover the artist's process and geometric preferences.

Her husband, Russell, had introduced her to the AI concepts. To use them, he said, did not require an actual computer, unless the mass of data was bewildering.

Only one element, linear composition, was examined. Fortunately, it is one of the strongest features of this artist's style. Diebenkorn, who was shown an AI-generated "Diebenkorn" reported that he felt a "shock of recognition."

Russell Kirsch has made another contribution to computer art that he couldn't resist mentioning, though he wasn't entirely happy with it: the pixel. He showed us the first pixel image created on a SEAC computer in 1958, when he was working for the National Bureau of Standards. To demonstrate his doubts, he showed a detail of Durer's "Melancholia" reproduced on the highest resolution computer screen available, and pointed out that the fine lines (i.e.,

the artist's intentions] do not translate at all well into pixels. He made another gloomy observation: "I have seen people who were making great contributions, in everything from genetics to art, being lured into computing, and becoming nothing but indifferent programmers. And I hate to admit it, but I was partly responsible for their doing so. It has been a net loss to society."

Proceedings of the 5th Symposium are available from SCAN, P.O. Box 1954, Philadelphia, PA 19105 for about $13.

"Five Aspects of Computer Art," explaining the major divisions in the field with images by 33 Ylem artists, is available from Ylem Video, 887 Morena, Palo Alto, CA 94303. Rental, $20.

Escaping the Confines of Practically Everything

I made my way from the Nikpar tower through the urban campuses of two universities to an office complex called University City Science Center looking for the "Art-in-Science V" reception. I knew I had arrived when I spotted a 1933 diner with the "IFATS" tags. IFATS, or Institute For Advanced Creative Thinking & Stuff, will cook up offbeat collaborative acts between now and January 31, and invited ideas from our readers. The Maitre d', Phil Simkin, will be remembered by some San Franciscans for his Capp [redacted]. project, The Cable Knitted News. There, front page stories by the yard were machine-knitted during the Democratic Convention.

Two other artists [and whoever else they can rope in] are creating projects during the same period. They also are sponsored by the Science Center. I found them inside the Center's Gallery, beside the brie. One [redacted] the artists, Tom Paretti, showed digitized images [redacted]st he [redacted]d sent to an artist in Arizona who does image enhancement. Some of the images, shown in motion on a souped-up Apple, were quite wonderful. Images may be sent to him by disk or CompuServe for modification and elaboration.

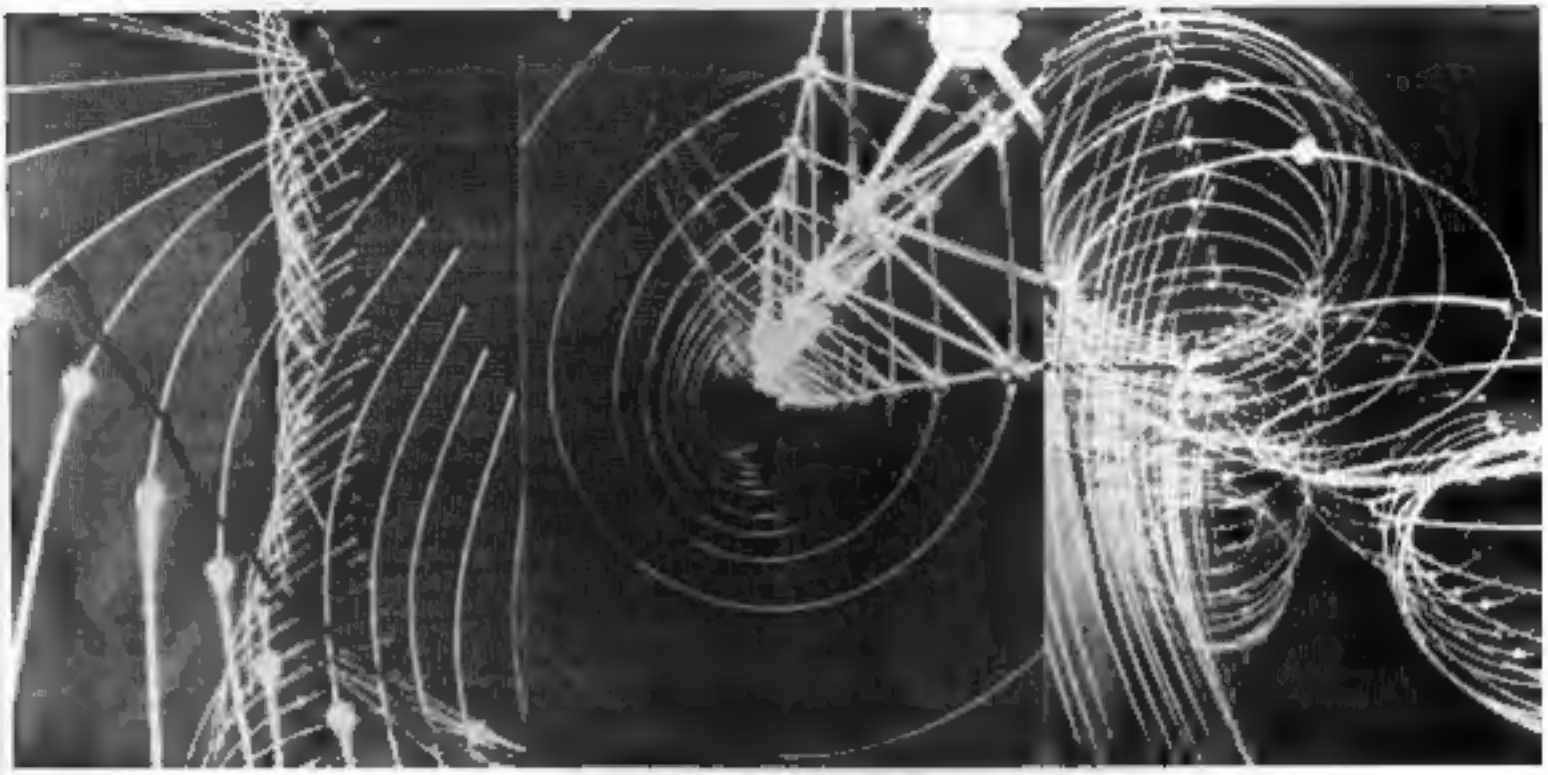
Artist Lois Johnson asked for postcards from anywhere in the country to make a set of offset prints based on postcards cum maps. She will be working with a team of printers to produce art prints on high-speed, four-color presses. Printmakers know that this is not only more difficult than it sounds, but almost a contradiction of terms.

All three artists can be reached at University City Science Center Art Gallery, 3624 Market Street, Philadelphia, PA 19104.

Back at the conference, I had a few words with Ylem member Dee Matson, of Pitman NJ, who has just mounted a big mail art show in a bank near Independence Hall. Official sponsorship got his group a beautiful site, but Mail Art is by its nature a no-holds-barred medium, and the sponsors blanched when they saw some of the art. He is also the originator of the stencil happening that was seeking slogans in our newsletter.

Finally, Paul Rutkovsky was passing around "Florida Doodah," his tabloid chock full of forces, collaborations, and ads ("Misery .88, Youth .88, Forgiveness 1.39, STOCK UP NOW.") "Send me images, I'll print them--but maybe change them a bit." He also publishes a cartoon rag, "GET", consisting of his satiric drawings done on a Macintosh. Subscriptions to each are $8, from 227 Westridge Drive, Tallahassee, FL 32304.

**Trudy also saw Ylem member Lewis Kompelt, who said, "Reconnaissance is pleased to announce that we are currently working with several museums and other institutions on the placement and exhibition of hi-tech art work. We invite artists to submit slides and samples of their work so that we can introduce their work to our clients. We also invite inquiries from collectors and institutions interested in holography, computer/electronic art, light sculpture, and the other technological arts."



THE MENTAL EDIFICES OF MILTON KOMISAR

By Grace Reim

"Plucking the Twanger," shown at the Kala Institute Gallery from Oct. 11-Nov. 18, is a 25 foot high, 50 foot wide piece of visual electronic music. Physically, it is a massive array of plastic tubes and rods. Experientially, it is a blazing, rhythmic edifice of color and light.

The "Twanger" is more than the culmination of the sculptor's second major series. It is the medium with which he verbalizes his personal point of view.

Referring to his childhood, Komisar explains that he grew up in the mid-50's as a Jew in Tennessee. Though involved as Captain of his football team and President of his high-school class, he had a private side that separated him from that particular world. While others rocked to the music of Little Richard, Komisar savored that of Beethoven.

Music is manifest in his work, and he wanted to be a part of it—perhaps a conductor. But he realized that "music takes much practice... I was afraid of that."

Komisar graduated in 1958 from Vanderbilt with his Bachelor's Degree in Philosophy, but he hesitated to pursue the PhD which would equip him to teach the subject. Studying at the SF Art Institute, he became convinced that while music requires practiced, technical knowledge, learning to draw does not require much information, but tremendous nurturing and easing-- "the visual arts are self-learned."

He completed his Master's in Painting Degree at Berkeley in '62, and landed the Fulbright that took him to Germany in 1964. He went to Europe to study philosophy, but found himself rather studying various art forms.

He feels that he is a psychological person, but finds that he becomes frustrated expressing his thoughts verbally. "I am much more successful expressing myself in tangible art forms." Finding art to be the verbalization of the movement he senses in music, he "got paper and water colors together, and started from there."

He took his painting into an experimental mode, frustrated with the rectangular canvas. Just as music is "not focused, but scanned with the ear," he feels the world should be perceived peripherally, as well as from top to bottom. This marked the transition of his paintings from rectalinear to cylindrical, as perceived from within.

Komisar is quick to label Saint Saens his mentor, as painter, and as sculptor today. At the Tate Gallery in London, he experienced a landscape piece of the artist that "shifted from a pictoral to a living, kinetic form. Nature became not a picture, but a process." He feels that Saint Saens, "looking at reality from the impressionists' point of view, was expressing the new scientific point of view. He structured the sensual, the energy, the experience the impressionists were having, so that they could say, 'here is a language of energy and structure which can be applied in all sorts of ways.'"

Komisar's cylindrical paintings were first displayed in 1967 at the Berkeley Art Center. From 1969-1971, his 3-piece suburban environmental series--including "A Suburban House," "An Underground

THE MENTAL EDIFICES OF MILTON KOMISAR

Parking Lot," and "An Automobile Junkyard"--constituted a one-man show at the SF Museum of Modern Art. This series marked his transition from painting to light sculpture. He decided that "this was what he'd do."

He saw the image of light in his imagination, but needed to find the medium with which to express it.

Komisar worked for two years building a richly-baroque sculpture, "Nisus," which he exhibited in Walnut Creek. The Latin translation refers to Aristotle's belief that forms move from the potential state into their actual state. When Komisar began the sculpture, he did not know consciously what he was creating. "But unconsciously, I acted it out almost as though there was a force guiding it. There was an image in my psyche that I couldn't see--and didn't actually see until the piece was installed in Walnut Creek, suspended some 14' off the ground, and I could look at it from underneath."

Komisar soon began work on his second series of 8 sculptures, including the final piece "Plucking the Twanger." He built and programmed the first 3 over a 6-year period, which he describes as an "extremely difficult, heart-rending time, because I had no idea what the nature of the medium was. Sometimes things are clear, and can be simply expressed, as with a ruler. But sometimes the goal is more internal, and you just have to let go and feel your way through it. In that case, you can't let a ruler force you into a rigid structure. (And remember this was also a time when nobody knew how to use electronics and technology in the creation of art. There was not Ylem...) I was struggling at this time to define for myself the conditions I'd be working with to the present. The first 3 sculptures mapped out these specifications."

The 3 pieces--"Diamond," "Spines," and "Spaghetti"--represent the geometric, organic, and free-moving formats respectively. Komisar explains that these 3 motiffs are visible in the "Twanger" in their final state of balance. For this reason, he describes the sculpture as the culmination of the elements found in his previous work.

"I had difficulty in the creation of these first pieces, but it was much like childhood... childhood is extremely painful, but it is full of wonder. There is a certain joy in feeling that one is at the center of the universe. Along with maturity, you gain the ability to have distance, to separate yourself, becoming conscious and analytical. Like coming to realize that you are not the center of the universe, but part of a vast system. There is a great deal of adjustment going on there. When you deal with your material, you learn what your position is in the world, and then you deal consciously with it. In the earlier years, you were more unconscious about it."

Komisar's interest in science and technology comes from what he describes as "a layman's point of view." He believes that "science is a tool, a system for understanding reality in a more sensible, reasonable way than the religious method. I am a lover of science, but not a professional scientist. Science is our way, in the modern world, of understanding all the different facets of reality, all the way from the metaphysical to the specific."

The artist feels that every individual has a point of view, which is what he presents to the world. He claims that some people have a more forceful point of view than others--and cites Einstein as one example of an individual who formulated his point of view to have a great impact on the world. He finds that those with the greatest impact on others "realize where their gifts lie, and they don't go chasing around after other things. They focus in on what they can do well."

Komisar is likewise focusing in on his point of view, devoting his energies to expressing that point of view. He is quick to say that his certainly doesn't come close to that of Beethoven, or Saint Saens, or Einstein. "We all have to come to terms with whatever position we are in as a person in the world. I feel that I have something to give to the world, something to give to people. So my job is to realize that, make it more tangible, and to present it to other people. And this realizing process is my own self-discovery--my own self-realization."

Komisar is amazed and gratified that he is giving something to people of value, in this expression of his point of view. "I can work on what I do best, bring it out into the world to offer it to people, and they'll say, 'yes, that is right. We know about what you are showing us--it is true--but now we see and understand it better.' So, Saint Saens turned out his paintings, Beethoven wrote his symphonies, scientists continue to make new discoveries... and they are doing their jobs. We are all doing our jobs, according to the way we are wired up, according to our RNA and DNA. And by doing our jobs, we further the processes of evolution and cultural growth, and all of the things that make the stuff on this planet work."

What are Komisar's personal aspirations, in terms of his influence on the art world? He feels that a medium of time, light, and space will develop over the years, and hopes that he will be instrumental in that development. "We all make projections, and I guess in a way I am projecting that my enthusiasm will finally become the enthusiasm of the general culture. But it is not important whether or not that happens. My fantasy is that some 100 years from now, there will be fantastic shows of light phenomena, using the most advanced technology. And when they want to go back and look at the archaic forms, they'll dust off some of these 1960's sculptures that this guy did in Oakland, and they'll show the primitive beginnings of the movement. Yet within these primitive movements, man will see the vocabulary stated, and that would, in my fantasies, give me a great thrill. But again, whether or not that happens is not important. What keeps me going is not the fantasy of being immortalized, because that is impossible anyway. I'm into pushing this process to see where it takes me, and there's no getting out."

Ylem Membership Application

Send to: Ylem, P.O. Box 749, Orinda CA 94563

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ADDRESS _____

CITY _____ STATE ZIP

PHONE: DAYTIME EVENING

- ☐ to receive a sample issue
- ☐ $20 year's membership
- ☐ $15 student membership
- ☐ $15 newsletter only

U.S. Dollars only please

If joining, please also complete the section below.

Ylem Membership Update

Dear Members,

We are in the process of updating our files on Ylem members. We need your help to make it possible for us to compile our "Yellow Pages." Please complete this page for us. Also if you have samples of your work, we would be very interested in seeing them.

NAME_____ ADDRESS_____

ARTISTIC MEDIA

Please mark 1 or 2. Beside each, please state in 26 letters your specialty. (i.e. : "illus. + images on cloth," "hi-res computer modeling," "bronze casting.")

__ conceptual art:
__ computer graphics/computer assisted art:
__ crafts:
__ exhibits/performance planning:
__ graphic design:
__ kinetic/interactive light or sound:
__ music:
__ 2-D fine arts (i.e. painting, printmaking, illustration, photography):
__ 3-D fine arts (i.e. sculpture, architecture):
__ video/film:
__ writing:
__ multi-media (hi-tech):
__ multi-media (not hi-tech)
__ other hi-tech
__ other

AREAS OF INTEREST: (Do not duplicate info. listed above.) Circle two.

__ Aesthetics
__ Architecture
__ Computer Graphics
__ Computer Science
__ Education
__ Engineering
__ Hi-tech Media
__ Mathematics/Puzzles
__ Natural Sciences: Biology, Geology, Botany
__ Pattern and Structure
__ Perceptual phenomenon/Visualization
__ Psychology
__ Physics, Chemistry
__ Space, Astronomy, Cosmology
__ Societies/Culture
__ Universe/Mind

On an additional piece of paper please include what your artistic philosophy is (one paragraph only) and in what areas could technical assistance from Ylem members be useful in your work.

Send to: Ylem, P.O. Box 749, Orinda CA 94563

WHAT IS YLEM?

By Fred Stitt

Simple. "Ylem" is the primordial stuff from which the universe was created. (Pronounce it "Eye-lum" and you've got it.)

It's also a thriving organization of artists and art lovers who are enamored of science and technology.

That particularly means artists who work with video, ionized gases, computers, lasers, holograms, and other non-traditional media.

It also includes artists who use traditional media but who are inspired by the images, structures, and growth geometries of crystals, electromagnetic phenomenon, and biological self-replication.

The Ylem organization helps keep members informed of opportunities to show their work in upcoming exhibits, competitions, conferences, etc. It also publicizes and shows off members' work through its own publications and events. The active membership includes many well-known bay area figures in the arts and gallery world as well as collectors, educators, students, engineers, architects, and scientists.

Diverse techno-aesthetic interests are demonstrated every other month at the YLEM FORUMS held alternately in San Francisco and on the Peninsula. They include presentations by practicing scientists who appreciate the aesthetic values within their disciplines and artists who enjoy the science and technology that underlies all art.

The Ylem Forums are hosted by Ylem founder Trudy Myrrh Reagan. Trudy almost single handedly nurtured and guided Ylem through the past few difficult formative years, providing a newsletter, field trips, expansive networking among hundreds of Ylem members, and the always amazing Forums.

The next Ylem Forum is scheduled for April 5, 1986, 2:00-5:30 PM, at the auditorium of Stanford Linear Accelerator Center, 2575 Sand Hill Road, Menlo Park (near highway 280). It's all about "HOLOGRAMS AND LASER ART–THE CUTTING EDGE," presented for YLEM by L.A.S.E.R. a leading Bay Area holographic/laser organization.

Ylem also publishes a monthly Ylem Calendar - devoted to news of Forums, field trips, gallery openings, exhibits, presentations, parties, opportunities, and what-have-you.

Subscriptions to the Journal and the Calendar come with membership which costs $20 per year (subscription only is $15). You can join/subscribe or get a free sample of each by writing to Ylem, Box 749, Orinda, CA, 94563. Or for more information, call the President of Ylem, well-known glass and neon artist Beverly Reiser, (afternoons only) at (415) 482-2483.

YLEM

ARTISTS USING SCIENCE & TECHNOLOGY

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